

# Eureka Math *A Story of Units*

## Fifth Grade – Module 6

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Materials based on Eureka Math Version 3.



## Module Assessment Overview

### Purpose of Assessments

**Mid-Module Assessment:** These tasks address approximately the **first half** of the module's learning objectives, and provide important information for instruction and for grading.

**End-of-Module Assessment:** These tasks are based on all standards addressed in order to gauge students' full range of understanding of the **module as a whole**. The End-of-Module assessment should carry more weight than the Mid-Module Assessment in terms of student grades in the appropriate domain.

### Administration of Assessments

- Mid- and End-of-Module Assessments are designed to be completed in approximately one class period. However, The tests can be given over multiple days as needed.
- Assessments are designed to be completed independently by students, without assistance.
- These tasks should not be preceded by review of similar problems.

### Grading Guidance

The grading scale on Elementary Report Cards has been changed for 2015-2016 and beyond. Please note that ***4 now indicates advanced understanding of grade level standards expected at this time of year.***

- 4 – Advanced:** Student demonstrates advanced understanding of grade level standards expected at this time of year.
- 3 – Proficient:** Student demonstrates proficiency with grade level standards expected at this time of year.
- 2 – Basic:** Student demonstrates basic understanding of grade level standards expected at this time of year. Student needs additional support and practice.
- 1 – Below Basic:** Student demonstrates minimal understanding of grade level standards expected at this time of year. Student needs significant support and practice.

**Rubrics have been updated to reflect this change. Rubrics have been further modified from Eureka Math originals for clarity, accuracy, and alignment to Bethel's grade scale.**

#### General Grading Guidance:

- On the report card, student learning is reported by CCSS domain. The Fifth Grade CCSS domains are: Operations and Algebraic Thinking, Number and Operations in Base Ten, Number and Operations – Fractions, Measurement and Data, and Geometry.
- Grades in each domain should be based on multiple sources of evidence, including the Mid- and End-of-Module Assessments. The End-of-Module assessment should carry more weight than the Mid-Module Assessment in terms of student grades in the appropriate domain.

#### Module 6 Grading Guidance:

- 5.OA.2 is taught and assessed for the last time in Module 6. The remaining standards taught and assessed in Module 6 are only taught and assessed in this module. (See checklist on page 3.)

## Grade 5 Common Core State Standards Checklist by Module

This grade-level chart provides an at-a-glance view of when each standard is addressed. **Shaded boxes indicate standards assessed in Module 6.** Note that standards included in major clusters are followed by an asterisk (\*). Please refer to the Curriculum Overview of A Story of Units for a curriculum map and detailed grade-level descriptions including a summary of the year, a rationale of the module sequence, and a standards alignment chart.

CCSS		GRADE 5 MODULES					
		1	2	3	4	5	6
5.OA	1		X		X		
	2		X		X		X
	3						X
5.NBT	1*	X	X				
	2*	X	X				
	3a*	X					
	3b*	X					
	4*	X					
	5*		X				
	6*		X				
	7*	X	X		X		
5.NF	1*			X			
	2*			X			
	3*				X		
	4a*				X		
	4b*					X	
	5a*				X		
	5b*				X		
	6*				X		
	7a*				X		
	7b*				X		
	7c*				X		
5.MD	1	X	X		X		
	2				X		
	3a*					X	
	3b*					X	
	4*					X	
	5a*					X	
	5b*					X	
	5c*					X	
5.G	1						X
	2						X
	3					X	
	4					X	

## Fifth Grade Module 6: Mid-Module Assessment Task Score Sheet

### A Progression of Learning

A Progression of Learning is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left to right. The learning goal for each student is to move to the last step, “Evidence of solid reasoning with a correct answer”. These steps are meant to help teachers and students identify and celebrate what the student CAN do now, and what they need to work on next.

Score Key: A Progression of Learning			
Little or no evidence of reasoning with an incorrect answer.	Evidence of some reasoning with an incorrect answer.	Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer.	Evidence of solid reasoning with a correct answer.
(1 Point)	(2 Points)	(3 Points)	(4 Points)

	Module 6 Mid-Module Assessment						
	Domain				Standards		
Question	Operations and Algebraic Thinking		Geometry		5.OA.2	5.OA.3	5.G.1
1			1 2 3 4				X
2			1 2 3 4				X
3	1 2 3 4		1 2 3 4			X	X
4			1 2 3 4				X
5	1 2 3 4		1 2 3 4		X	X	X
6	1 2 3 4		1 2 3 4			X	X

Domain Score	Operations and Algebraic Thinking		Geometry	
Total Points				
Level	4	11-12 pts.	4	21-24 pts.
	3	8-10 pts.	3	15-20 pts.
	2	5-7 pts.	2	9-14 pts.
	1	3-4 pts.	1	6-8 pts.

Note: For more information about standards assessed in this module, see back of this score sheet.

Notes:

## Fifth Grade Module 6: Mid-Module Assessment Task Score Sheet (continued)

### Mid-Module Assessment Task (Topics A–B) Clusters and Standards Addressed

#### Write and interpret numerical expressions.

- 5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as  $2 \times (8 + 7)$ . Recognize that  $3 \times (18932 + 921)$  is three times as large as  $18932 + 921$ , without having to calculate the indicated sum or product.*

#### Analyze patterns and relationships.

- 5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

#### Graph points on the coordinate plane to solve real-world and mathematical problems.

- 5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g.,  $x$ -axis and  $x$ -coordinate,  $y$ -axis and  $y$ -coordinate).

**Fifth Grade Module 6: Mid-Module Assessment Task Rubric**

A Progression of Learning				
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer.  (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer..  (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer.  (4 Points)
<b>1</b>  <b>5.G.1</b>	The student correctly gives the coordinates for <b>0-1</b> of the five points using correct notation.	The student correctly gives the coordinates for <b>2-3</b> of the five points using correct notation.	The student correctly gives the coordinates for <b>4</b> of the five points using correct notation.	The student correctly gives the coordinates for <b>5</b> of the five points using correct notation. (See below)
	(1) A (3, 4)	(2) B (4, 2)	(3) C ( $\frac{1}{2}$ , $\frac{1}{4}$ )	(4) D (1, $2\frac{1}{2}$ ) (5) E ( $1\frac{3}{4}$ , $4\frac{1}{4}$ )
<b>2</b>  <b>5.G.1</b>	The student correctly plots and labels <b>0</b> of the three points.  OR The student correctly plots 1 point but does not label it.	The student correctly plots and labels <b>1</b> of the three points.  OR The student correctly plots 2 points but does not label them.	The student correctly plots and labels <b>2</b> of the three points.  OR The student correctly plots 3 points but does not label them.	The student correctly plots and labels <b>3</b> of the three points.
<b>3</b>  <b>5.G.1</b> <b>5.OA.3</b>	The student gives <b>0-1</b> of the six points.	The student gives <b>2-3</b> of the six points.	The student gives <b>4-5</b> of the six points.	The student gives <b>6</b> of the six points. (See below.)
<b>Use this rubric to double score #3. (Use the same score for G and OA.)</b>	<ul style="list-style-type: none"> <li>▪ <b>(1, 2, 3)</b> Gives three collinear points on a vertical line (all three points have the same <math>x</math>-coordinate), one of which has a mixed number as a coordinate.</li> <li>▪ <b>(4, 5, 6)</b> Gives three collinear points on a horizontal line (all three points have the same <math>y</math>-coordinate), one of which has a fraction as a coordinate.</li> </ul>			
<b>4</b>  <b>5.G.1</b>	The student is neither able to identify Garrett's placement as correct nor able to explain the reasoning used.	The student: <b>(1)</b> Does not identify Garrett's placement as correct, but <b>(2)</b> does explain the reasoning used.	The student: <b>(1)</b> Identifies Garrett's placement as correct, but <b>(2)</b> Explanation lacks clarity.	The student: <b>(1)</b> Identifies Garrett's placement as correct. <b>(2)</b> Clearly explains the reasoning used.



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<p style="text-align: center;"><b>5</b></p> <p style="text-align: center;"><b>5.G.1</b> <b>5.OA.2</b> <b>5.OA.3</b></p> <p><b>Use this rubric to double score #5. (Use the same score for G and OA.)</b></p>	<p>The student correctly answers <b>0-2</b> of the seven parts.</p>	<p>The student correctly answers <b>3-4</b> of the seven parts.</p>	<p>The student correctly answers <b>5-6</b> of the seven parts.</p>	<p>The student correctly answers <b>7</b> of the seven parts. (See below.)</p>
<p><b>6</b></p> <p style="text-align: center;"><b>5.G.1</b> <b>5.OA.3</b></p> <p><b>Use this rubric to double score #5. (Use the same score for G and OA.)</b></p>	<p>The student correctly answers <b>0-3</b> of the eight parts.</p>	<p>The student correctly completes <b>4-5</b> of the eight parts.</p>	<p>The student correctly completes <b>6-7</b> of the eight parts.</p>	<p>The student correctly completes <b>8</b> of the eight parts. (See below.)</p>
	<p><b>Part (a)</b></p> <p><b>(1)</b> Table A: <math>(0, 0); (1, \frac{1}{2}); (2, 1); (3, 1\frac{1}{2})</math></p> <p><b>(2)</b> Table B: <math>(0,0); (1, \frac{1}{4}); (2, \frac{1}{2}); (3, \frac{3}{4})</math></p> <p><b>Part (b)</b></p> <p><b>(3)</b> Plots points for Table A, and <b>(4)</b> connects points with a line</p> <p><b>(5)</b> Plots points for Table B, and <b>(6)</b> connects points with a line</p> <p><b>(7)</b> Describes the relationship between corresponding terms such that terms in Table A are twice the terms in Table B, or that B is half of A using words or notation (e.g., Multiply A by 2, A is twice as much as B, B is half of A, <math>2 \times A = B</math> or <math>\frac{1}{2} B = A</math>).</p>			
	<ul style="list-style-type: none"> <li>▪ <b>(1, 2, 3, 4, 5)</b> Correctly identifies the ordered pairs from the graph as (1,4); (2,6); (3,8); (4,10); (5,12).</li> <li>▪ <b>(6, 7, 8)</b> Generates three collinear points whose y-coordinates are greater than 14 and/or whose x-coordinates are greater than 30.</li> </ul>			



## Fifth Grade Module 6: Mid-Module Assessment Task Key

Name Allison Date \_\_\_\_\_

1. Give the coordinates of each point.

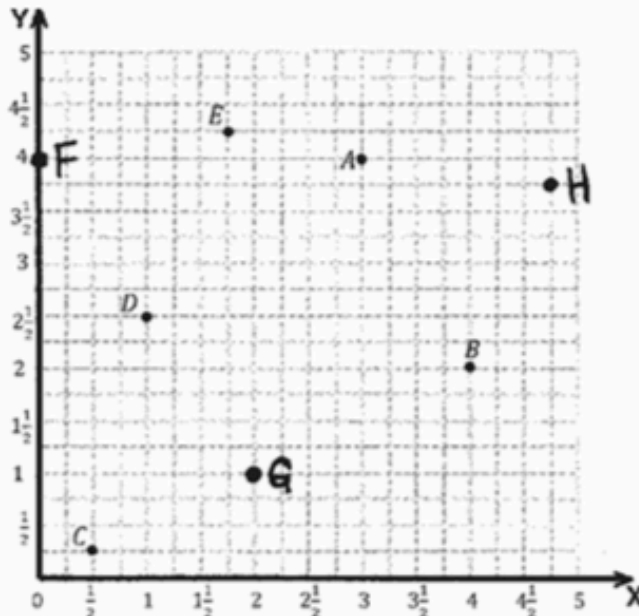
A (3, 4)

B (4, 2)

C ( $\frac{1}{2}$ ,  $\frac{1}{4}$ )

D (1,  $2\frac{1}{2}$ )

E ( $1\frac{3}{4}$ ,  $4\frac{1}{4}$ )



2. Plot each point in the coordinate plane above, and label each point with *F*, *G*, or *H*.

*F* (0, 4)

*G* (2, 1)

*H* ( $4\frac{3}{4}$ ,  $3\frac{3}{4}$ )

- 3.

- a. Give coordinates for any three points that are on the same vertical line. Include at least one point that has a mixed number as a coordinate.

(1, 2) (1,  $3\frac{1}{2}$ ) (1, 4)

- b. Give coordinates for any three points that are on the same horizontal line. Include at least one point that has a fraction as a coordinate.

( $\frac{3}{4}$ , 2) (2, 2) (9, 2)

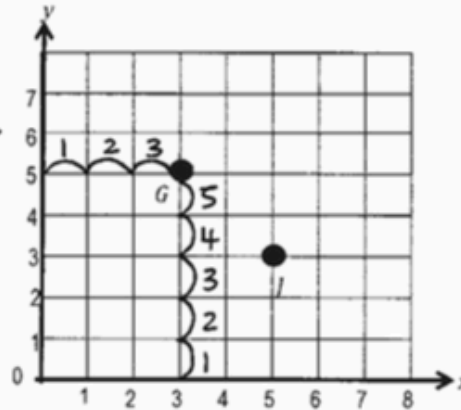


## Fifth Grade Module 6: Mid-Module Assessment Task Key (continued)

4. Garrett and Jeffrey are planning a treasure hunt. They decide to place a treasure at a point that is a distance of 5 units from the  $x$ -axis and 3 units from the  $y$ -axis. Jeffrey places a treasure at point  $J$  and Garrett places one at point  $G$ . Who put the treasure in the right place? Explain how you know.

Garrett put the treasure in the right place. When you measure out to point  $G$  from the  $y$ -axis it is 3 units. Point  $G$  is 5 units up from the  $x$ -axis.

Jeffrey's treasure is 3 units from the  $x$ -axis and 5 units from the  $y$ -axis.



5. a. Find the  $y$  coordinates by following the rules given for each table.

Table A: Multiply by  $\frac{1}{2}$

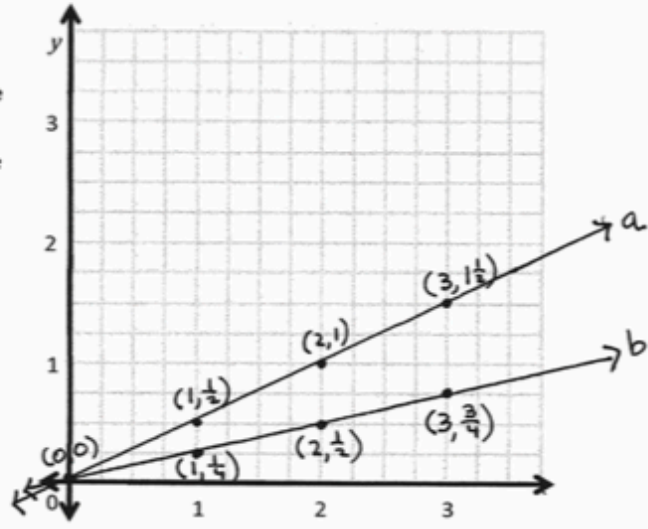
$x$	$y$
0	0
1	$\frac{1}{2}$
2	1
3	$1\frac{1}{2}$

Table B: Multiply by  $\frac{1}{4}$

$x$	$y$
0	0
1	$\frac{1}{4}$
2	$\frac{1}{2}$
3	$\frac{3}{4}$

## Fifth Grade Module 6: Mid-Module Assessment Task Key (continued)

- b. Graph and label the coordinate pairs from Table A. Connect the points and label the line *a*.  
a. Graph and label the coordinate pairs from Table B. Connect the points and label the line *b*.

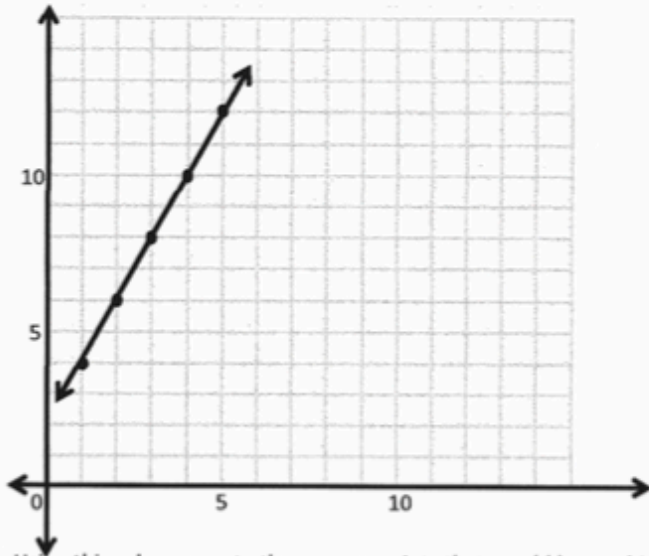


- c. Describe the relationship between the y-coordinates in Table A and Table B that have the same x-coordinate.

The y-coordinates in Table A are twice as much as Table B. They are two times bigger in Table A.

6.

- a. Use the graph to give the coordinate pairs of the points marked on the line.



x	y
1	4
2	6
3	8
4	10
5	12

- b. Using this rule, generate three more points that would be on this line but lie beyond the portion of the coordinate plane that is pictured.

The rule is multiply by 2, and then add 2 to get the y-coordinates. (16, 34) (17, 36) (18, 38)

## Fifth Grade Module 6: End-of-Module Assessment Task Score Sheet

### A Progression of Learning

A Progression of Learning is provided to describe steps that illuminate the gradually increasing understandings that students develop *on their way to proficiency*. In this chart, this progress is presented from left to right. The learning goal for each student is to move to the last step, “Evidence of solid reasoning with a correct answer”. These steps are meant to help teachers and students identify and celebrate what the student CAN do now, and what they need to work on next.

Score Key: A Progression of Learning			
Little or no evidence of reasoning with an incorrect answer.	Evidence of some reasoning with an incorrect answer.	Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer.	Evidence of solid reasoning with a correct answer.
(1 Point)	(2 Points)	(3 Points)	(4 Points)

Module 6 End-of-Module Assessment							
Domain				Standards			
Question	Operations and Algebraic Thinking			Geometry			
1							
2							
3	1	2	3	4			
4	1	2	3	4			

Domain Score	Operations and Algebraic Thinking		Geometry	
Total Points				
Level	4	7-8 points	4	11-12 points
	3	5-6 points	3	8-10 points
	2	3-4 points	2	5-7 points
	1	2 points	1	3-4 points

Note: For more information about standards assessed in this module, see back of this score sheet.

Notes:

## Fifth Grade Module 6: End-of-Module Assessment Task Score Sheet (continued)

### End-of-Module Assessment (Topics A–D) Clusters and Standards Addressed

#### Write and interpret numerical expressions.

- 5.OA.2** Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. *For example, express the calculation “add 8 and 7, then multiply by 2” as  $2 \times (8 + 7)$ . Recognize that  $3 \times (18932 + 921)$  is three times as large as  $18932 + 921$ , without having to calculate the indicated sum or product.*

#### Analyze patterns and relationships.

- 5.OA.3** Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. *For example, given the rule “Add 3” and the starting number 0, and given the rule “Add 6” and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.*

#### Graph points on the coordinate plane to solve real-world and mathematical problems.

- 5.G.1** Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g.,  $x$ -axis and  $x$ -coordinate,  $y$ -axis and  $y$ -coordinate).
- 5.G.2** Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

## Fifth Grade Module 6: End-of-Module Assessment Task Rubric

A Progression of Learning																					
Assessment Task Item and Standards Assessed	STEP 1 Little or no evidence of reasoning with an incorrect answer.  (1 Point)	STEP 2 Evidence of some reasoning with an incorrect answer.  (2 Points)	STEP 3 Evidence of some reasoning with a correct answer or evidence of solid reasoning with an incorrect answer. (3 Points)	STEP 4 Evidence of solid reasoning with a correct answer.  (4 Points)																	
1  5.G.1	The student correctly completes 0-1 of the six parts.	The student correctly completes 2-3 of the six parts.	The student correctly completes 4-5 of the six parts.	The student correctly completes 6 of the six parts. (See below.)																	
	(1) Draws a ray with points at coordinates $(1\frac{1}{2}, 3)$ and $(5, 3)$ . (2) Labels point $L$ . (3) Labels point $K$ . (4) Gives the coordinates of three other points on the ray. (Correct answers are any two coordinates with the $y$ -coordinate of 3.) (5) Draws a second ray with one point at the coordinates $(1\frac{1}{2}, 3)$ and point $M$ at $(3\frac{1}{2}, 4\frac{1}{4})$ . (6) Labels point $M$ .																				
2  5.G.1 5.G.2	The student correctly completes 0-1 of the five parts.	The student correctly completes 2-3 of the five parts.	The student correctly completes 4 of the five parts.	The student correctly completes 5 of the five parts.																	
	a. (1) Draws $\overline{QR}$ and (2) Labels $\overline{QR}$ . b. (3) Draws a line perpendicular to $\overline{QR}$ and (4) Labels point $S$ . c. (5) Names one of the following coordinates: $1\frac{1}{8}, 1\frac{3}{8}, 1\frac{1}{4}, 1\frac{1}{2}$ or equivalent $1\frac{3}{8}, 1\frac{5}{8}$																				
3  5.G.1 5.OA.2 5.OA.3  Use this rubric to double score #5. (Use the same score for G and OA.)	The student correctly answers 0-3 of the eight parts.	The student correctly answers 4-5 of the eight parts.	The student correctly answers 6-7 of the eight parts.	The student correctly answers 8 of the eight parts. (See below.)																	
	(1) Completes the table: <table><tr><th><math>x</math></th><th><math>y</math></th><th><math>(x,y)</math></th></tr><tr><td>0</td><td>2</td><td>(0,2)</td></tr><tr><td>1</td><td>4</td><td>(1,4)</td></tr><tr><td>2</td><td>6</td><td>(2,6)</td></tr><tr><td>3</td><td>8</td><td>(3,8)</td></tr><tr><td>4</td><td>10</td><td>(4,10)</td></tr></table> a. (2) Line $a$ .      b. (3) $(2, 6)$ .      c. (4) Draws and labels line $e$ parallel to the $x$ -axis, $y$ coordinate 2. d. (5) The $x$ -coordinate      e. (6) Add 4 or plus 4. f. (7) Lacy's rule will make a line parallel to line $a$ . (8) The rule for line $a$ is multiply $x$ by 2, add 2. The rule for Lacy's line is multiply $x$ -coordinate by 2 and add 4. Lacy's line is parallel because the steepness of the line is the same. (That is, the multiplication part of the rule is the same.) The adding part of the rule will make the $y$ -coordinates two more than those in line $a$ .)				$x$	$y$	$(x,y)$	0	2	(0,2)	1	4	(1,4)	2	6	(2,6)	3	8	(3,8)	4	10
$x$	$y$	$(x,y)$																			
0	2	(0,2)																			
1	4	(1,4)																			
2	6	(2,6)																			
3	8	(3,8)																			
4	10	(4,10)																			

Use this rubric to double score #5. (Use the same score for G and OA.)



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A Progression of Learning				
<p style="text-align: center;"><b>4</b> <b>5.G.1</b> <b>5.G.2</b> <b>5.OA.3</b></p> <p><b>Use this rubric to double score #5. (Use the same score for G and OA.)</b></p>	<p>The student has no correct answers for either Part (a) or Part (b).</p>	<p>The student has correctly answered either Part (a) or Part (b), but may not have a clear answer of <i>why</i> for Part (b).</p>	<p>The student has correctly answered both Part (a) and Part (b), but lacks a clear answer of <i>why</i> for Part (b).</p>	<p>The student has accurately completed Part (a) and Part (b), including a clear explanation of <i>why</i> for Part (b).</p> <p>a. The plane's altitude will be 2 miles.</p> <p>b. No, the pilot should not continue this pattern. If he continues this pattern, his plane will have 0 altitude between 1 and 2 miles past the airport (or other correct response).</p>



# Fifth Grade Module 6: End-of-Module Assessment Task Key

Name Julian Date \_\_\_\_\_

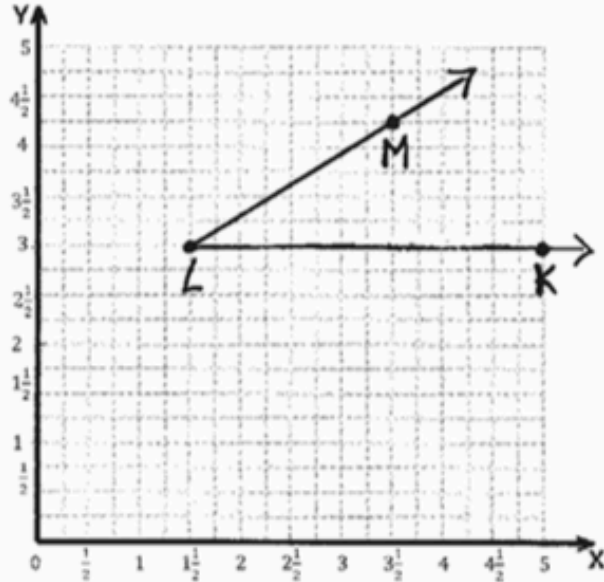
1. Follow the directions.

- a. Draw a ray that starts at point  $L$  at  $(1\frac{1}{2}, 3)$  and includes point  $K$  at  $(5, 3)$ . Label points  $K$  and  $L$ .

- b. Give the coordinates of three other points on the ray.

$(2\frac{1}{3}, 3)$   $(4, 3)$   $(4\frac{3}{4}, 3)$

- c. Draw a second ray with the same initial point and containing point  $M$  with coordinates  $(3\frac{1}{2}, 4\frac{1}{4})$ . Label point  $M$ .



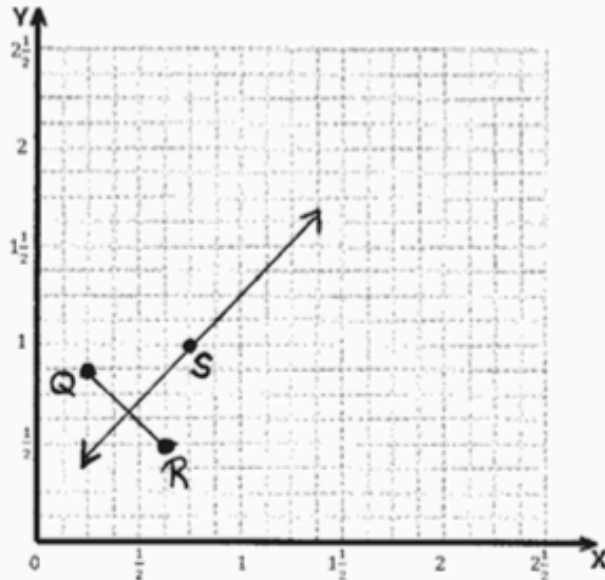
2. David draws a line segment from point  $Q$  ( $\frac{1}{4}, \frac{7}{8}$ ) to point  $R$  ( $\frac{5}{8}, \frac{1}{2}$ ). He then draws a line perpendicular to the first segment that intersects segment  $\overline{QR}$  and includes point  $S$  ( $\frac{3}{8}, 1$ ).

- a. Draw  $\overline{QR}$  and label the endpoints on the grid.

- b. Draw the perpendicular line and label point  $S$ .

- c. Name another point that lies on the perpendicular line whose  $x$ -coordinate is between 1 and  $1\frac{1}{2}$ .

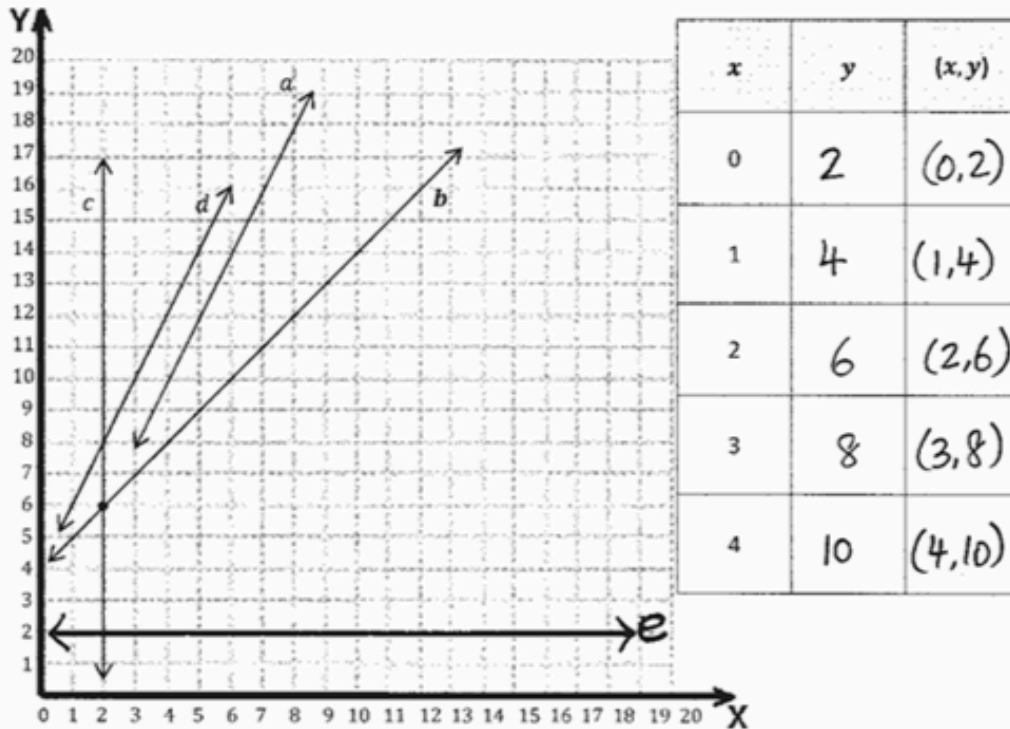
$(1\frac{1}{8}, 1\frac{3}{8})$





**Fifth Grade Module 6: End-of-Module Assessment Task Key (continued)**

3. Complete the table for the rule *multiply by 2 then add 2* for the values of  $x$  from 0 to 4. Then use the coordinate plane to answer the questions.



- a. Which line shows the rule in the table?

Line a

- b. Give the coordinates for the intersection of lines  $b$  and  $c$ .

(2, 6)

- c. Draw a line on the graph such that any point on the line has a  $y$ -coordinate of 2. Label your line as  $e$ .

- d. Which coordinate is 2 for any point on line  $c$ ?

$x$ -coordinate



## Fifth Grade Module 6: End-of-Module Assessment Task Key (continued)

- e. Write a rule that tells how to find the  $y$ -coordinate when the  $x$ -coordinate is given for the points on line  $a$ .

$(1, 5)$   
 $(2, 6)$   
 $(3, 7)$  Add 4 to the  $x$ -coordinate to get the  $y$ -coordinate.

- f. Kim and Lacy want to draw a line on the coordinate plane that is parallel to line  $a$ . Kim uses the rule, multiply by 4 and add 2 to generate her  $y$ -coordinates. Lacy uses the rule multiply by 2 and add 4 to generate her  $y$ -coordinates. Which girl's line will be parallel to line  $a$ ? Without graphing the lines, explain how you know.

Lacy's line will be parallel, because Line  $a$ 's rule is to multiply by 2, then add 2. Lacy kept the multiplication the same ( $\times 2$ ), so the new line will be the same steepness as Line  $a$ . Lacy only changed the addition part of the rule. That's going to make the new line above Line  $a$  on the plane if she graphs it.

4. An airplane is descending into an airport. When its altitude is 5 miles, it is 275 miles from the airport. When its altitude is 4 miles, it is 200 miles from the airport. At 3 miles, it is 125 miles from the airport.

- a. If the pilot follows the same pattern, what will the plane's altitude be at 50 miles from the airport?

The plane's altitude will be 2 miles when it's 50 miles from the airport.

- b. For the plane to land at the airport, the altitude will need to be 0 and the distance from the airport will need to be 0. Should the pilot continue this pattern? Why or why not?

The pilot should not keep this pattern. He will be way past the airport when his altitude is 0 miles.

